

Application Serial No.: 10/627,143
Applicant(s): Spector et al.

Docket No.: N.C. 84,766

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Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

Claim 1 (withdrawn) A composition of matter, comprising: a hydrogel polymer containing a sugar, said hydrogel being the polymerization reaction product of a sugar compound with a polymerizable double bond, a crosslinker with two or more polymerizable double bonds, and a third compound with a polymerizable double bond and a group selected from the group consisting of amino or carboxyl groups.

Claim 2 (withdrawn) The composition according to claim 1, wherein said polymer is generally represented by the structure of FIGURE 1.

Claim 3 (withdrawn) The composition according to claim 1, wherein said crosslinker is selected from the group consisting of bis- acrylamide, bis-acrylate, or bis-vinyl compounds.

Claim 4 (withdrawn) The composition according to claim 1, wherein said third compound is an acryl- substituted oligonucleotide.

Claim 5 (withdrawn) The composition according to claim 1, wherein said sugar compound is a sugar selected from the group consisting of sugar acrylate or methacrylate as represented by (1).

Claim 6 (withdrawn) The composition according to claim 1, wherein said sugar compound is selected from the group consisting of acryl-monosaccharides, disaccharides, oligosaccharides, or polysaccharides.

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Claim 7 (withdrawn) The composition according to claim 1, wherein said sugar compound is an acrylate derivative of an oligohydroxy compound.

Claim 8 (withdrawn) The composition according to claim 1, wherein said sugar compound is 6-acryloyl- β -O-methylgalactopyranoside.

Claim 9 (withdrawn) The composition according to claim 1, wherein said sugar compound is selected from the group consisting of furanose or pyranose sugars.

Claim 10 (withdrawn) The composition according to claim 1, wherein said sugar compound is an α or β anomer.

Claim 11 (withdrawn) The composition according to claim 5, wherein R_1 of said sugar acrylate (1) contains a substituent selected from the group consisting of H, aliphatic, aromatic, cycloaliphatic, or carbohydrate.

Claim 12 (withdrawn) The composition according to claim 1, wherein said hydrogel polymer has a water content of at least 90%.

Claim 13 (withdrawn) The composition according to claim 1, wherein said hydrogel polymer has a pore size of 0.1-10 μ or larger.

Claim 14 (withdrawn) The composition according to claim 1, wherein said hydrogel polymer has pore size allowing for diffusion of molecules two microns in size into said hydrogel.

Claim 15 (withdrawn) The composition according to claim 1, wherein said third compound is selected from the group consisting of acrylic or methacrylic acids, amides or derivatives thereof.

Claim 16 (withdrawn) The composition according to claim 1, wherein said third compound is selected from the group whereby R_9 of FIGURE 1 is OH, amino, or an aminoalkylamine.

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Claim 17 (withdrawn) The composition according to claim 15, wherein said third compound is selected from the group consisting of an N-propylamino-acrylamide or N-propylamino-methacrylamide.

Claim 18 (withdrawn) The composition according to claim 1, wherein said third compound is a 2-acrylamidohydroxyacetic acid.

Claim 19 (withdrawn) A composition of matter, comprising: a hydrogel polymer containing a sugar, said hydrogel being the polymerization reaction product of a sugar acrylate, a bis-acrylamide cross linker and an aminoacrylic third compound selected from the groups of claim 17.

Claim 20 (withdrawn) A composition of matter, comprising: a hydrogel polymer containing a sugar, said hydrogel being the polymerization reaction product of a sugar acrylate, a bis-acrylamide cross linker and an acrylamidoglycolic acid.

Claim 21 (withdrawn) The composition according to claim 1, wherein said hydrogel polymer comprises amino groups on the backbone of said polymer.

Claim 22 (withdrawn) The composition according to claim 1, wherein said hydrogel polymer comprises carboxyl groups on said backbone of said polymer.

Claim 23 (withdrawn) A composition of matter comprising the reaction product of said amino groups on said backbone of said polymer of claim 21 with a member of the group consisting of oligonucleotides or proteins.

Claim 24 (withdrawn) The composition according to claim 23, wherein said oligonucleotide has 5' substituents selected from the group consisting of amino, aldehydic, carboxyl or phosphoro groups.

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Claim 25 (withdrawn) The composition according to claim 23, wherein said protein comprises CY3-labeled *Straphyloccal enterotoxin B* (SEB).

Claim 26 (withdrawn) A composition of matter comprising the reaction product of said carboxyl groups on said backbone of said polymer of claim 22, with a group consisting of oligonucleotides or proteins.

Claim 27 (currently amended) A method for assaying biomolecules, comprising the steps of:

A. functionalizing a support with acrylate groups;

B. ~~reacting said acrylate groups of said support with a hydrogel polymer selected from the group consisting of a composition of matter comprising a hydrogel polymer containing a sugar said hydrogel being the polymerization reaction product of a sugar compound with a polymerizable double bond a crosslinker with two or more polymerizable double bonds and a third compound with a polymerizable double bond and an amino or carboxyl group, a composition of matter comprising a hydrogel polymer containing a sugar said hydrogel being the polymerization reaction product of a sugar compound with a polymerizable double bond a crosslinker with two or more polymerizable double bonds and a third compound wherein said third compound is 2-acrylamidohydroxyacetic acid, and a composition of matter comprising a hydrogel polymer containing a sugar said hydrogel being the polymerization reaction product of a sugar acrylate a bis-acrylamide cross-linker and an aminoacrylic third compound selected from the group of acrylic acid, methacrylic acid, amides, and derivatives thereof consisting of an N-propylamino acrylamide or N-propylamino methacrylamide;~~

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forming a polyacrylate by reacting said acrylate groups of said support with a hydrogel polymer wherein the hydrogel polymer contains a poly(6-acryloyl-beta-O-methyl monosaccharide) and is the polymerization reaction product of a regioregular polyacrylate with a polymerizable double bond, a crosslinker with two or more polymerizable double bonds, and 2-acylamido hydroxyacetic acid, and wherein said hydrogel is linked to said glass plate through said acrylate groups;

C. reacting said biomolecule to be assayed with said hydrogel to form a covalent bond between said biomolecule and said hydrogel, and

D. assaying said biomolecule covalently bonded to said hydrogel.

Claim 28 (withdrawn - currently amended) The method of claim 27, wherein said biomolecule is a DNA molecule and wherein said hydrogel is the polymerization reaction product of a poly(6-acryloyl-beta-O-methyl monosaccharide) compound with a polymerizable double bond, a crosslinker with two or more polymerizable double bonds, and a third compound with a polymerizable double bond and an amino or carboxyl group.

Claim 29 (withdrawn - currently amended) The method of claim 28, wherein said DNA comprises up to 100,000 nucleotide base units and wherein the polyacrylate has an average pore diameter of about 10-micron.

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Claim 30 (currently amended) The method according to claim 27, ~~wherein said biomolecule is a protein.~~ wherein the polyacrylate comprises an interpenetrating network and has an average pore size of about 11 microns.

Claim 31 (currently amended) The method according to ~~claim 27~~ claim 30, ~~wherein said biomolecule assay is based on a biomolecule having a fluorophore group.~~ wherein the polyacrylate has a mechanically strong IPN structure and wherein the elastic modulus is in the range of from about 4.0 to about 10.3 MPa.

Claim 32 (withdrawn) The method according to claim 27, wherein said biomolecule is CY3- Staphylococcal enterotoxin B (SEB).

Claim 33 (currently amended) The method according to ~~claim 24~~ claim 31, wherein said biomolecule assay is based on fluorescence, nuclear, magnetic or optical methods commonly employed.